

REMARKS

Claims 1-3, 6-8, 11, 16, 17 and 30 have now alternately been rejected under 35 U.S.C. § 103(a) over the newly cited Liu et al. ('586) reference and the newly cited Frechet et al. ('411) references. Each of those references is cited as prior art under 35 U.S.C. § 102(e).

Claims 1 and 30 are the only independent claims pending. Each of Claims 1 and 30 now defines an acrylic block copolymer (A) which comprises a methacrylic polymer block (a) and an acrylic polymer block (b), wherein at least one of the polymer blocks contains, in its main chain, a special acid anhydride group (c) represented by formula (1). For reasons hereinafter discussed, applicants respectfully submit that amended Claims 1 and 30 define over each of the cited references in a manner which is plainly not shown or suggested.

Practically speaking, the acrylic block copolymer (A) of the claimed invention is both novel and very useful. It is rich in flexibility and excellent in mechanical strength, moldability, oil resistance, heat resistance, thermal decomposition resistance, weather resistance, and compression set. Furthermore, it is rich in reactivity and particularly suitable for seal products for automobiles, home and office electric appliances and for other automobile, electric and electronic parts.

More specifically, since the acid anhydride group (c) has reactivity with a compound having a functional group such as an amino group, a hydroxyl group, or an epoxy group, the acid anhydride group (c) can be used as a reactive site when modifying the acrylic block copolymer (A), as a compatibility-improving site when blending the acrylic block copolymer (A) with a cross-linked rubber, a thermoplastic resin and/or a thermoplastic elastomer, or as a cross-linking site when imparting an improved rubber elasticity to the acrylic block copolymer (A). Furthermore, the acid anhydride group (c) has an effect of improving the heat resistance of the acrylic block copolymer (A) when it is introduced into the methacrylic polymer block (a) (hard segment) because of its high glass transition temperature (T_g). The glass transition temperature of a polymer containing the acid anhydride group is, for instance, as high

as 159°C for poly(methacrylic anhydride), and the heat resistance of the acrylic block copolymer (A) can be improved by introducing such a polymer structure.

The process for introducing the acid anhydride group (c) preferably comprises melt-kneading an acrylic block copolymer (A') at a temperature of 180°C to 300°C, the acrylic block copolymer (A') comprising a methacrylic polymer block (a) and an acrylic polymer block (b). At least one of the polymer blocks contains, in its main chain, at least one unit represented by formula (2), wherein the unit represented by formula (2) undergoes elimination and cyclization with the adjacent ester unit at a high temperature during the melt-kneading step to produce an acid anhydride group (see cancelled method claim 23 and the description on page 35, line 10 to page 36, line 19 of the instant specification). The unit represented by formula (2) can be introduced into the acrylic block copolymer by copolymerization with an acrylate or methacrylate monomer derived from the unit represented by formula (2). In Examples disclosed in the instant specification, t-butyl methacrylate or t-butyl acrylate is copolymerized to give an acrylic block copolymer (A') and the copolymer (A') is heated at a temperature of 180°C to 300°C, thereby introducing an acid anhydride group (c).

In contrast to the inventions defined in Claims 1 and 30, Liu et al. and Frechet et al. disclose maleic anhydride (which would result in units of formula (1) with $n=0$) as an example of hydrophilic monomers used for production of block copolymers such as ABA block copolymer, but neither of Liu et al. or Frechet et al. disclose working examples directed to block copolymers containing units derived from maleic anhydride and teach or suggest the significance of the introduction of acid anhydride group into a block copolymer. As such, the claimed acid anhydride group (c) represented by formula (1) with $n=1$ to 3 is clearly distinguished from the unit derived from maleic anhydride.

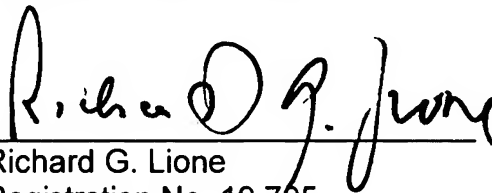
It is recognized that maleic anhydride (maleic acid) is difficult to polymerize singly and, in general, maleic anhydride (maleic acid) is copolymerized. Therefore, it is difficult to introduce the maleic anhydride unit in a high content. On the contrary, the acid anhydride group (c) represented by formula (1) with $n=1$ to 3 can be introduced via the unit represented by formula (2), which can be polymerized singly. Therefore, it is easy to obtain an acrylic block copolymer (A) containing the acid anhydride group (c) in a range of from low content to high content, which enables a variety of molecular

designs. For example, an acrylic block copolymer (A) having high heat resistance can be obtained by introducing the acid anhydride group (c) into a methacrylic polymer block (a) (hard segment) in a high content.

In summary, Liu et al. and Frechet et al. disclose t-butyl acrylate and t-butyl methacrylate. However, neither of Liu et al. or Frechet et al. teach or suggest the introduction of acid anhydride group (c) by the heat treatment of a copolymer containing such monomers. As a result, a person skilled in the art having no teaching as to the significance of the introduction of acid anhydride group into a block copolymer would have no motivation to introduce the acid anhydride group (c) represented by formula (1) wherein $n=1$ to 3 into an acrylic block copolymer.

The sum and substance of the foregoing analysis is that each of independent claims 1 and 30 is critically distinct from the teaching and/or suggestion of Lieu et al and Frechet et al. As such, applicants respectfully submit the applicants should be in allowable form.S

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Richard G. Lione", written over a horizontal line.

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